

REMARKS

Claims 1 and 19 have been amended. Claims 1 – 15 and 17 – 19 are pending for examination. Favorable reconsideration and allowance of this application is respectfully requested in light of the amendment and the foregoing remarks. No new matter has been added.

Rejection of Claims under 35 U.S.C. §103

Claims 1, 2, 4, 5, and 19 were rejected under the provisions of 35 U.S.C. §103 as obvious by Armstrong (U.S. 3,939,933) in view of Tesar (U.S. 5,355,743).

Applicant's amended Claim 1 recites a hydraulic steering device for centre pivot steered vehicles with a centre pivot joint between major first and second ground-engaging components of the vehicles. The device includes at least one hydraulic swiveling vane motor for producing the steering. The swiveling vane motor is in the form of a centre pivot steering joint of the centre point-steered vehicle or is arranged in the rotary axis of the centre point steering joint of the vehicle. The swivel vane motor comprises at least one fixed vane and at least one moveable vane commonly arranged on the rotary axis of the centre pivot joint wherein the fixed vane is fixed in relation to the first ground-engaging component, the moveable vane is fixed in relation to the second ground-engaging component, and movement of the movable vane relative to

the fixed vane causes pivotal motion about the rotary axis which results in vehicle steering movement.

Armstrong shows a transmission control system having a hydraulic pump in communication with an auxiliary hydraulically operated ram incorporated above an articulation joint. While Armstrong discloses the invention as applied to a hydraulically operated ram acting on a steering arm, it also notes it could be applied to vane motor or other hydraulic steering device. It however does not disclose the position or configuration of the vane motor nor provide any detail on how steering would be accomplished. Specifically, Armstrong does not recite Applicant's positioning of the swiveling vane motor in the form of a centre pivot steering joint of the centre point-steered vehicle or is arranged in the rotary axis of the centre point steering joint of the vehicle. Armstrong further lacks Applicant's alignment of the rotary axis of the swiveling vane motor on the centre pivot axis and that the fixed vane and housing of the swiveling vane motor are fixed in relation to one portion of the vehicle while the movable vane is fixed in relation to the other portion of the vehicle such that rotary movement of the swivel vane motor directly results in pivotal motion of the first and second ground-engaging portions of the vehicle about the centre pivot axis. Simply stated, Applicant claims a swivel vane motor in which the rotor and stator act directly on the forward and rearward portions, respectively, of a centre pivot steered vehicle or that may be used as an alternative to the centre pivot joint itself.

Tesar shows a robotic actuator module comprising a motor driving an epicyclic gear train for inducing relative motion of members joined in a robotic joint. The motor may be electric, pneumatic, or hydraulic. However, unlike Applicant's claimed invention in which the driver is a high torque, small displacement swivel vane motor (less than 360 degrees of freedom of rotation), Tesar is directed toward low torque, high displacement drives and relies upon torque multiplication of the gear-train. As with the Armstrong reference discussed, Tesar fails to disclose a swivel vane drive wherein the movable and stationary elements of the drive are directly connected to first and second portions of an articulated vehicle and are aligned on the pivotal axis.

As neither reference alone or in combination shows or suggests all of the elements of Applicant's Claim 1, Armstrong in view of Tesar are inadequate obviousness references. Withdrawal of the rejection is respectfully requested. Claims 2, 4, 5, and 19 depend, either directly or indirectly from Claim 1 and should be allowable for at least the same reasons.

Claims 4 – 5 are separately patentable as they incorporate additional swivel vane motors arranged above or below the centre pivot joint along the rotary axis opposite of the first swivel vane motor. This configuration increases the available steering torque or allows reduction in the size of each of the individual swiveling motors. As the maximum steering torque results from the total volumes of all the motors working together, thus an optimum ratio of size to the possible steering torque is achieved. Armstrong and Tesar

do not show any vane motor configuration using multiple motors, particularly arranged along the rotary axis of the vehicle.

Claim 19 is further patentable as it the swiveling motor is positioned in the joint (integral to the joint) such that a connecting section of a first ground engaging portion of a vehicle runs through the swiveling motor and bearing points of the swiveling motor form a turning bearing between the first and a connecting section of a second ground engaging component of the vehicle. Neither Armstrong nor Tesar show the swiveling motor forming the joint of a centre-pivot steered vehicle as recited.

Claims 3, 6 – 10 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Armstrong in view of Tesar and Sprinkle et al. (US PG/PUB 2003/0013575).

Claims 3 and 6 – 11 depend, either directly or indirectly, from Claim 1 and should be allowable for at least the same reasons cited above. Sprinkle discloses a variable displacement pump controlled by a microprocessor connected to a sensor, but fails to disclose Applicant's swivel vane motor in which the rotor and stator act directly on the forward and rearward portions, respectively, of a centre-pivot steered vehicle. Thus, Armstrong in view of Tesar and Sprinkle fail to suggest all of the elements of Applicant's Claim 1, much less claims depending therefrom. Withdrawal of the rejection is respectfully requested.

Claims 12 – 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Armstrong in view of Tesar and Sprinkle as applied to Claim 7, and further in view of Sakamoto (US 5,584,346).

Claims 12 – 14 depend directly from Claim 7 and indirectly from Claim 1; they should be allowable for at least the same reasons discussed above. Sakamoto discloses man-machine interface (joystick) for a controller on a grader, but fails to disclose Applicant's claimed swivel vane motor in which the rotor and stator act directly on the forward and rearward portions, respectively, of a centre-pivot steered vehicle. Further, Sakamoto only shows a joystick with a return to neutral function for setting a target blade tilt angle. It does not show any use of force feedback that transmits forces felt in actual operations relating to the steering of the vehicle. Thus, Armstrong in view of Tesar and Sprinkle and Sakamoto fail to suggest all of the elements of Applicant's Claim 1, much less claims depending therefrom. Withdrawal of the rejection is respectfully requested.

Claims 17 and 18 were rejected under the provisions of 35 U.S.C. §103(a) as being unpatentable over Armstrong in view of Tesar and Sprinkle as applied to Claim and 11, and further in view of Sakaki (US PG/PUB 2002/0170769).

Claims 17 and 18 indirectly depend from Claim 1 and should be allowable for at least the same reasons discussed above. Sakaki discloses power steering assist device in which operation of a pump is controlled dependent upon a steering wheel

input angle in order to steering wheel feedback to the vehicle operator. However, Sakaki fails to disclose Applicant's claimed swivel vane motor in which the rotor and stator act directly on the forward and rearward portions, respectively, of a centre-pivot steered vehicle. Thus, Armstrong in view of Tesar, Sprinkle, and Sakaki fail to suggest all of the elements of Applicant's Claim 1, much less claims depending therefrom. Withdrawal of the rejection is respectfully requested.

Conclusion

In summary, Claims 1 and 19 have been amended in response to this action. Claims 1 – 15 and 17 – 19 remain pending for examination. Applicant submits that the claims as herein presented are in a condition for allowance, and timely and favorable notice to this effect is respectfully solicited. Applicant respectfully requests that all rejections be withdrawn and all remaining claims be allowed. No new matter has been added.

Application No. 10/535,125
Amendment dated October 8, 2009
Reply to Office Action of July 8, 2009
Attorney Docket No. 18062

Pursuant to currently recommended Patent Office practice, the Examiner is expressly authorized to call Applicant's attorney, if in his judgment disposition of this application could be expedited or if he considers the application ready for final disposition by other than allowance. Applicants' undersigned attorney may be reached at the phone and fax numbers listed below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Andrew D. Mead". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

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